



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
06.06.2012 Bulletin 2012/23

(51) Int Cl.:
F04C 18/16 (2006.01) **F04C 28/12** (2006.01)
F04C 28/16 (2006.01)

(43) Date of publication A2:
16.06.2010 Bulletin 2010/24

(21) Application number: **09252754.8**

(22) Date of filing: **09.12.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
AL BA RS

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(30) Priority: **09.12.2008 US 330548**

(60) Divisional application:
12000731.5 / 2 458 217

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(54) **Temperature control through pulse width modulation**

(57) A refrigerant compressor assembly (10) for a refrigeration circuit controls the temperature within a temperature controlled space (11). The refrigerant compressor assembly includes a first unloading valve (26), a first valve actuator (92), and a first valve control system (96) that adjusts the first valve actuator via a pulse-width-modulated signal, a second unloading valve (30), a second valve actuator (140), and a second valve control system

(144) that adjusts the second valve actuator via a pulse-width-modulated signal. The refrigerant compressor assembly (10) also includes a third unloading valve (34). The first valve actuator (92) is coupled to the first (26) and third (34) unloading valves and controlled by the first valve control system (96). The unloading valves selectively allow or resist fluid flow from higher to lower pressure areas within the refrigerant compressor assembly.

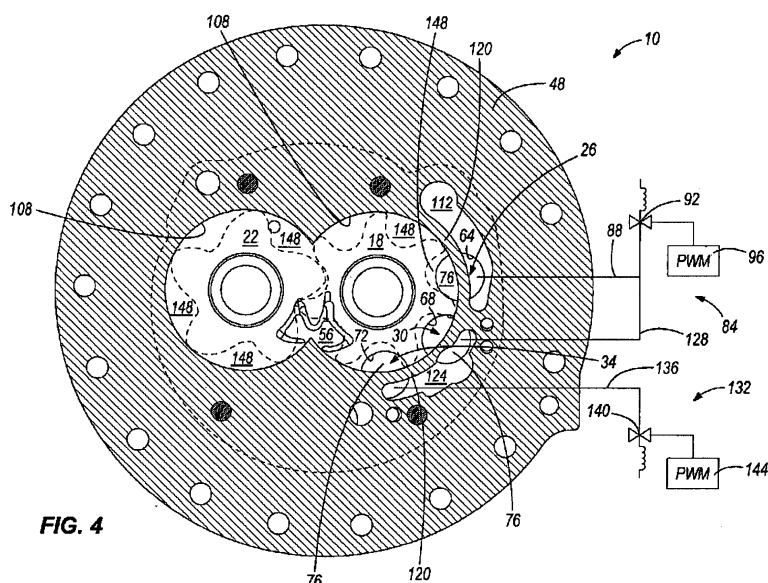


FIG. 4

**PARTIAL EUROPEAN SEARCH REPORT**

Application Number

under Rule 62a and/or 63 of the European Patent Convention.
This report shall be considered, for the purposes of
subsequent proceedings, as the European search report

EP 09 25 2754

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	GB 2 323 413 A (COLTEC IND INC [US]) 23 September 1998 (1998-09-23) * figures 1-3 * * page 1 - page 2 * * page 7 - page 13 *	1-4,11, 12	INV. F04C18/16 F04C28/12 F04C28/16
Y	JP 2002 070779 A (MITSUBISHI HEAVY IND LTD) 8 March 2002 (2002-03-08) * figures 1-3 * * abstract * * paragraph [0026] *	1-4,11, 12	
A	JP 58 072690 A (NIPPON SOKEN; NIPPON DENSO CO) 30 April 1983 (1983-04-30) * figures 1-4 * * abstract *	1-4,11, 12	
A	US 2002/037230 A1 (SJOHOLM LARS IVAN [US] ET AL) 28 March 2002 (2002-03-28) * figures 1-9 * * paragraph [0013] * * paragraph [0025] *	1-4	
			TECHNICAL FIELDS SEARCHED (IPC)
			F04C
INCOMPLETE SEARCH			
<p>The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC so that only a partial search (R.62a, 63) has been carried out.</p> <p>Claims searched completely :</p> <p>Claims searched incompletely :</p> <p>Claims not searched :</p> <p>Reason for the limitation of the search:</p> <p>see sheet C</p>			
Place of search		Date of completion of the search	Examiner
Munich		16 April 2012	Durante, Andrea
CATEGORY OF CITED DOCUMENTS		<p>T : theory or principle underlying the invention</p> <p>E : earlier patent document, but published on, or after the filing date</p> <p>D : document cited in the application</p> <p>L : document cited for other reasons</p> <p>& : member of the same patent family, corresponding document</p>	
<p>X : particularly relevant if taken alone</p> <p>Y : particularly relevant if combined with another document of the same category</p> <p>A : technological background</p> <p>O : non-written disclosure</p> <p>P : intermediate document</p>			

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EPO FORM 1503 03.02 (P04E07)



**INCOMPLETE SEARCH
SHEET C**

Application Number

EP 09 25 2754

Claim(s) completely searchable:
1-4, 11, 12

Claim(s) not searched:
5-10, 13-15

Reason for the limitation of the search:

The search has been restricted to the subject-matter of independent claims 1 and 11, together with associated dependent claims, as indicated by the applicant in his fax of 03 February 2012 filed in reply to the invitation pursuant to Rule 62a(1) EPC.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 25 2754

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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16-04-2012

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82